CLAIM AMENDMENTS

1. (previously presented) A porous particulate composition comprising a hydrozirconated matrix further comprising at least one zirconium component and at least one polymer having a plurality of olefin groups wherein the zirconium component is chemically bonded to the matrix through hydrocarbon groups derived from reacting at least one zirconium compound with covalently bound olefin groups of the polymer.

2. (Cancelled)

3. (previously presented) The composition of claim 1, wherein the olefin groups are selected from the group consisting of vinyl, allyl, alkenyl, alkynyl, conjugated olefin groups, olefin groups having polar substituents and combinations thereof.

4. (previously presented) The composition of claim 1, wherein the polymer having a plurality of olefin groups is selected from the group consisting of divinylbenzene polymers, divinylbenzene copolymers, styrene/divinylbenzene copolymers, divinylbenzene resins, cross-linked divinylbenzene polymers, cross-linked butadiene polymers, styrene/butadiene copolymers, styrene/isoprene copolymers, vinylsiloxane polymers, vinylsiloxane copolymers, divinylbenzene/vinylsiloxane copolymers, condensation products of vinyl siloxane polymers and copolymers and combinations thereof.

5. (previously presented) The composition of claim 4, wherein polymers having a plurality of olefin groups are formed in the presence of porogens.

6. (previously presented) The composition of claim 1, wherein a plurality of olefin groups are disposed on surfaces of organic materials and one or more polymers.

7. (previously presented) The composition of claim 4, wherein the polymer having a plurality of olefin groups is a macroporous polymeric material prepared from a suspension polymer.

8. (previously presented) The composition of claim 7, wherein the macroporous polymer is prepared from divinylbenzene.

9. (previously presented) The composition of claim 1, wherein the polymer is selected from the group consisting of: at least one inorganic polymer, at least one hybrid organic-inorganic polymer and combinations thereof, each polymer having a plurality of olefin groups.

10. (Original) The composition of claim 9, wherein the olefin groups are selected from the group consisting of vinyl, allyl, alkenyl, alkynyl, conjugated olefin groups, olefin groups having polar substituents and combinations thereof.

11. (Cancelled)

12. (previously presented) The composition of claim 9, wherein a plurality of olefin groups are disposed on polymer surfaces.

13. (previously presented) The composition of claim 1, wherein the polymer having a plurality of olefin groups is a vinylsiloxane.

14. (previously presented) The composition of claim 1, wherein the zirconium component is an organozirconium compound capable of undergoing a hydrozirconation reaction.

15. (previously presented) The composition of claim 14, wherein the organozirconium compound is selected from the group consisting of bis

(cyclopentadienyl)zirconium dihydride, bis (pentamethylcyclopentadienyl) zirconium dihydride, bis (methylcyclopentadienyl) zirconium dihydride, bis (n-butylcyclopentadienyl) zirconium dihydride, bis (indenyl) zirconium dihydride, bis (1-fluorenyl) zirconium dihydride, bis (cyclopentadienyl) zirconium hydrido chloride, bis (pentamethylcyclopentadienyl) zirconium hydrido chloride, bis (methylcyclopentadienyl) zirconium hydrido chloride, bis (n-butylcyclopentadienyl) zirconium hydrido chloride, bis (indenyl) zirconium hydrido chloride, bis (fluorenyl) zirconium dihydrido chloride, bis (cyclopentadienyl)zirconium methyl hydride, bis (pentamethylcyclopentadienyl) zirconium methyl hydride, bis (methylcyclopentadienyl) zirconium methyl hydride, bis (n-butylcyclopentadienyl) zirconium methyl hydride, bis (pentamethylcyclo-pentadienyl)zirconium (phenyl)(hydride), bis (pentamethylcyclopentadienyl) zirconium (methyl)(hydride), bis (indenyl) zirconium methyl hydride, bis (1-fluorenyl) zirconium methyl hydride, methylene bis(cyclopentadienyl) zirconium methyl hydride, methylene bis(cyclopentadienyl) zirconium hydrido chloride, methylene bis(cyclopentadienyl) zirconium dihydride, ethylene bis(cyclopentadienyl) zirconium methyl hydride, ethylene bis(cyclopentadienyl) zirconium hydrido chloride, dimethylsilyl bis(cyclopentadienyl) zirconium methyl hydride, ethylene bis(cyclopentadienyl) zirconium dihydride, dimethylsilyl bis(cyclopentadienyl) zirconium dihydride, methylene(cyclopentadienyl) (1-fluorenyl) zirconium methyl hydride, dimethysilyl(cyclopentadienyl) (1-fluorenyl) zirconium dihydride, isopropyl(cyclopentadienyl)(1-fluorenyl) zirconium methyl hydride, isopropyl(cyclopentadienyl) (1-octahydrofluorenyl) zirconium methyl hydride, dimethylsilyl(methylcyclopentadienyl) (1-fluorenyl) zirconium dihydride, methylene(cyclopentadienyl) (tetramethylcyclopentadienyl) zirconium methyl hydride, methylene(cyclopentadienyl) (tetramethylcyclopentadienyl) zirconium dihydride, ethylenebis(indenyl)zirconium dihydride, ethylenebis(indenyl)zirconium hydrido chloride, ethylenebis(indenyl)zirconiummethylhydride, dimethylsilylbis(indenyl)-zirconium methylhydride, dimethylsilylbis(indenyl)zirconium dihydride, dimethylsilylbis(indenyl)zirconium hydridochloride, ethylenebis(tetrahydroindenyl)-zirconium dihydride, ethylenebis(tetrahydroindenyl)zirconium methyl hydride, ethylenebis(tetrahydroindenyl)zirconium hydrido chloride, dimethylsilylbis(3-

trimethylsilylcyclopentadientyl)zirconium dihydride, dimethylsilylbis(3-trimethylsilylcyclopentadientyl)zirconium methyl hydride, chemically and structurally related zirconium compounds and combinations thereof.

16. (Cancelled)

17. (Canceled)

18. (Canceled)

19. (Canceled)

20. (Canceled)

21. (previously presented) A porous particulate catalyst composition comprising a hydrozirconated matrix further comprising at least one zirconium component and at least one polymer having a plurality of olefin groups wherein the zirconium component is chemically bonded to the matrix through hydrocarbon groups derived from reacting at least one zirconium compound with covalently bound olefin groups of the polymer and at least one activator component.

22. (Cancelled)

23. (previously presented) A catalytic composition of claim 21, wherein the hydrozirconated matrix further comprises a plurality of catalytic components.

24. (previously presented) The catalyst composition of claim 21, wherein at least one activator component is selected from the group consisting of: alumoxanes, alkylalumoxanes, methylaluminoxane (MAO), modified methyl aluminoxane (MMAO), isobutylaluminoxane, butylaluminoxane, heptylaluminoxane and

methylbutylaluminoxane, aluminum alkyls, $Al(C_2H_5)_3$, Al $(CH_2CH(CH_3)_2)_3$, $Al(C_3H_7)_3$, $Al((CH_2)_3CH_3)_3$, $Al((CH_2)_5CH_3)_3$, $Al(C_6F_5)_3$, $Al(C_2H_5)_2Cl_1$, $A1_2(C_2H_5)_3C1_2$, $A1C1_3$, boranes, organoboranes, trifluoroborane, triphenylborane, Tris(4-fluoro-phenyl)borane, Tris(3,5-difluorophenyl)borane, Tris(4-fluoromethylphenyl)borane, Tris(pentafluoro-phenyl)borane, Tris(tolyl)borane, Tris(3,5-dimethylphenyl)borane, Tris(3,5-difluorophenyl)borane, Tris(3,4,5trifluorophenyl)borane, borates, organoborates, dimethylanilinium tetra(pentafluorophenyl) borate, sodium [B {3, 5 - $(CF_3)_2C_6F_3$}$_4$], [H $(OEt_2)_1$ [B {3, 5 - $(CF_3)_2C_6F_3$}$_4$], triaryl carbenium tetraarylborates, N,N-dialkylanilinium borate salts, N,N-dimethylanilinium tetrakis(pentafluorophenyl)borate, N,N-diethylanilinium tetra(phenyl)borate, N,N-2,4,6-pentamethylanilinium tetraphenyl-borate, chemically related Group 13 compounds, dialkyl ammonium salts, di(i-propyl)ammonium tetrakis(pentafluorophenyl)borate, dicyclohexylammonium tetra(phenyl)boron, chemically related Group 13 anions, triaryl phosphonium borate salts, triphenylphosphonium tetraphenylborate, tri(methylphenyl)phosphonium tetra(phenyl)borate, tri(dimethylphenyl)phosphonium tetra(phenyl)borate, chemically related non-coordinating anions, and combinations thereof.

25. (previously presented) The catalyst composition of claim 21, wherein the hydrozirconated matrix is represented by a formula $[Cp^1Cp^2MR]^+$ $[NCA]^-$, wherein M is zirconium, Cp^1 is a substituted or non-substituted cyclopentadienyl ring and Cp^2 is the same or different, substituted or non-substituted cyclopentadienyl ring and may be bridged symmetrically or asymmetrically to Cp^1, R is a hydrocarbyl group derived from the hydrozirconation of the polymer having a plurality of olefin groups and NCA is a non-coordinating anion selected from the group consisting of: dimethylanilinium tetra(pentafluorophenyl) borate, sodium [B {3, 5 - $(CF_3)_2C_6F_3$}$_4$], [H $(OEt_2)_1$ [B {3, 5 - $(CF_3)_2C_6F_3$}$_4$], triaryl carbenium tetraarylborates, N,N-dialkylanilinium borate salts, N,N-dimethylanilinium tetrakis(pentafluorophenyl)borate, N,N-diethylanilinium tetra(phenyl)borate, N,N-2,4,6-pentamethylanilinium tetraphenyl-borate, chemically related Group 13 compounds; dialkyl ammonium borate salts, di(i-propyl)ammonium tetrakis(pentafluorophenyl)borate, dicyclohexylammonium tetra(phenyl)boron, triaryl

phosphonium borate salts, triphenylphosphonium tetraphenylborate, tri(methylphenyl)phosphonium tetra(phenyl)borate, tri(dimethylphenyl)phosphonium tetra(phenyl)borate, chemically related Group 13 anions, chemically related non-coordinating anions and combinations thereof.

26. (Currently amended) The composition of claim 1 [[and 21]], wherein the hydrozirconated matrix is prepared from polymers having particle diameters ranging from 2 nm to 1000 μm.

27. (Withdrawn) An olefin polymerization process that comprises contacting at least one olefin monomer and at least one hydrozirconated matrix having at least one catalytic component, polymerizing the olefin monomer to produce a polyolefin.

28. (Withdrawn) The process according to claim 27, wherein the olefin monomer is selected from the group consisting of unbranched aliphatic olefins having from 2 to 12 carbon atoms, branched aliphatic olefins having from 4 to 12 carbon atoms, unbranched and branched aliphatic α-olefins having from 2 to 12 carbon atoms, conjugated olefins having 4 to 12 carbon atoms, aromatic olefins having from 8 to 20 carbons, unbranched and branched cycloolefins having 3 to 12 carbon atoms, unbranched and branched acetylenes having 2 to 12 carbon atoms, and combinations thereof.

29. (Withdrawn) The process according to claim 27, wherein the olefin monomer is a polar olefin monomer having from 2 to 12 carbon atoms and at least one atom selected from the group consisting of O, N, B, Al, S, P, Si, F, Cl, Br and combinations thereof.

30. (Withdrawn) The process according to claim 27, wherein the olefin monomer is selected from the group consisting of ethylene, propene, 1-butene, 1-hexene, butadiene, styrene, alpha-methylstyrene, cyclopentene, cyclohexene, cyclohexadiene, norbornene, norbornadiene, cyclooctadiene, divinylbenzene, trivinylbenzene, acetylene, diacetylene, alkynylbenzene, dialkynylbenzene, ethylene/1-butene, ethylene/isoprene, ethylene/1-

hexene, ethylene/1-octene, ethylene/cyclopentene, ethylene/cyclohexene, ethylene/butadiene, ethylene/hexadiene, ethylene/styrene, ethylene/acetylene, propene/1-butene, propene/styrene, propene/butadiene, propene/1,6-hexadiene, propene/acetylene, ethylene/propene/1-butene, ethylene/propene/1-hexene, ethylene/propene/1-octene, and combinations thereof.

31. (Withdrawn) The process according to claim 27, wherein at least one polyolefin formed from the polymerization is selected from the group consisting of polyethylene, polypropylene, and polystyrene.

32. (Withdrawn) The process according to claim 27, wherein the polymerization is a copolymerization of ethylene and higher α-olefins.

33. (Withdrawn) The process according to claim 27, wherein the polymerization is a copolymerization of propene and higher α-olefins.

34. (Withdrawn) The process according to claim 27, wherein the polymerization is a copolymerization of styrene and higher α-olefins.

35. (Withdrawn) The process according to claim 27, further comprising stereospecific polyolefins.

36. (Withdrawn) The process according to claim 27, further comprising stereoregular polyolefins.

37. (Withdrawn) The process according to claim 27, further comprising polyolefins having stereospecific structures selected from the group consisting of atactic, isotactic, syndiotactic, hemi-isotactic and stereoregular block combinations thereof.

38. (Withdrawn) The process according to claim 27, further comprising polyolefins incorporating a plurality of olefin monomers.

39. (Withdrawn) The process according to claim 27, wherein the polyolefin is selected from the group consisting of HDPE, LDPE, LLDPE and combinations thereof.

40. (Withdrawn) The process according to claim 27, wherein the polyolefin is a copolymer of ethylene and α-olefins selected from the group consisting of 1-butene, 1-hexene and 1-octene.

41. (Withdrawn) The process according to claim 27, wherein a polyolefin particle essentially retains shape of a prepared matrix particle.

42. (Cancelled)

43. (Withdrawn) The process according to claim 27, wherein the catalytic component is a single-site catalyst system.

44. (Withdrawn) The process according to claim 27, wherein the polyolefin is prepared in a reactor system selected from the group consisting of gas phase reactors, slurry phase reactors and solution phase reactors and combinations thereof.

45. (Withdrawn) A coating process comprising depositing the hydrozirconated matrix of claim 1 on a substrate and polymerizing olefin monomer to produce a polyolefin coated surface, object or particulate.

46. (Withdrawn) The process according to claim 45, wherein the substrate is selected from the group consisting of clays, micas, silicates, metals, non-metal oxides, organometallic oxides and inorganic oxides.

47. (Withdrawn) A process for preparing a composite of substrate and polyolefin in-situ using the hydrozirconated matrix of claim 1 in combination with at least one substrate.

48. (Withdrawn) A process according to claim 47, wherein the substrate is selected from the group consisting of clays, micas, silicates, metals, non-metal oxides, organometallic oxides and inorganic oxides.

49. (Withdrawn) A process according to claim 47, wherein polyolefin properties are modified.

50. (Withdrawn) A process according to claim 49, wherein the property modified is fire retardancy.

51. (Withdrawn) A process for the production of hydrophobically modified particles in the form of spheres, surfaces and objects in which a catalytic hydrozirconated matrix is disposed on the surfaces thereof.